

**REMARKS**

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 20, 21, 24-27, and 30-41 are now present in the application. The specification has been amended. Claims 1-19 have been cancelled. Claims 20 and 27 are independent. Reconsideration of this application, as amended, is respectfully requested.

**Claim Rejections Under 35 U.S.C. §112**

Claims 32-41 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

Applicants respectfully submit that the subject matter of claims 32-41 is fully disclosed in the original application. Claims 32, 34-37 and 39-41 are shown, for example, in FIG. 6. Claims 33 and 38 are shown, for example, in FIGs. 7 and 8. As the Examiner will note, the specification has been amended to describe the subject matter of claims 32-41. Accordingly, claims 32-41 comply with the written description requirement. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, first paragraph, are therefore respectfully requested.

**Claim Rejections Under 35 U.S.C. § 102**

Claims 20, 21, 24-27, and 30-41 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Wagner et al., Applied Physics Letters pp. 89-90. This rejection is respectfully traversed.

Independent claims 20 and 27 recite combinations of elements including “at least one layer of a surface nanometer functional structure being formed on a surface of the nanostructure (in claim 20)/nanowire (in claim 27), the surface nanometer functional structure includes at least one of a plurality of micro nanowires and a plurality of nanodots”. Applicants respectfully submit that the above combinations of elements as set forth in independent claims 20 and 27 are not disclosed nor suggested by the reference relied on by the Examiner.

Applicants have presented the argument that Wagner merely teaches that the silicon whisker in FIG. 2a is a 1000 Angstrom whisker, rather than a nanostructure or a nanowire recited in claims 20 and 27, respectively (see page 89, lines 44-47). In response to this point, the Examiner stated that Wagner also discloses that the whisker can be in a wide range of dimensions. Therefore, the Examiner took the position that the silicon whisker teaches the nanostructure or a nanowire recited in claims 20 and 27. Applicants respectfully disagree.

In particular, Wagner never discloses that the silicon whisker is nanostructure or a nanowire. Instead, Wagner discloses

VLS growth of Si whiskers can occur over a wide range of cross-sectional dimensions, *as shown by the 1000 Angstrom whisker and the 0.2-mm needle in FIG. 2a and 2b.*

(Wagner, page 89, lines 44-47)(emphasis added).

In other words, Wagner merely teaches that the range of cross-sectional dimensions of the silicon whisker can be between  $10^{-7}\text{m}$  and  $10^{-4}\text{m}$ . Wagner fails to teach that the range of cross-sectional dimensions of the silicon whisker can reach the level of the nanometer, i.e.,  $10^{-9}\text{m}$ . It is impressive hindsight reconstruction based on Applicant's own disclosure to assert that the "wide range of cross-sectional dimensions" disclosed in Wagner teaches the level of the nanometer. The Examiner is simply making unsupported assumption, i.e., "wide range" = "nanometer level", which is not taught in the prior art.

The Examiner correctly indicated that Wagner fails to teach any structure branched from the silicon whisker or applied to a side of the silicon whisker as recited in dependent claims 32, 34-37 and 39-41. However, the Examiner alleged that it would have been obvious to use Wagner's method of vaporization to grow a structure branched from the silicon whisker or applied to a side of the silicon whisker. Applicants respectfully disagree.

First, the Examiner is simply making another unsupported assumption which is not taught in the prior art. Wagner merely teaches that the silicon whisker grows in the direction of <111> only (see FIGs.

1b and 2a; page 89, line 30). Wagner nowhere teaches or suggests growing a structure branched from the silicon whisker or applied to a side of the silicon whisker. If the Examiner persists in taking this position, then the Examiner is requested to supply prior art showing such features.

Second, Applicants respectfully submit that one skilled in the art would not be able to grow the structure branched from the silicon whisker or applied to a side of the silicon whisker simply based on Wagner's vaporization method. In particular, Wagner teaches that a particle of Au is first placed in a <111> surface of a Si wafer and a droplet of liquid Au-Si alloy is formed by heating (see FIGs. 1a; page 89, lines 25-28). Then the vapor of SiCl<sub>4</sub> is applied so that the silicon can enter the liquid Au-Si alloy and ride atop the growing whisker (see FIG. 1b, page 89, lines 33-39). In other words, the liquid Au-Si alloy would determine the direction of the growth of the silicon whisker. Since the liquid Au-Si alloy always starts in a <111> surface of a Si wafer, no structure can be grown in a direction other than <111>. Accordingly, no structure would be branched from the silicon whisker or applied to a side of the silicon whisker.

Since Wagner fails to teach each and every limitation of independent claims 20 and 27 or their dependent claims, Applicants respectfully submit that claims 20 and 27 and their dependent claims clearly define over the teachings of Wagner. Accordingly, reconsideration

and withdrawal of the rejection under 35 U.S.C. § 102 are respectfully requested.

### **CONCLUSION**

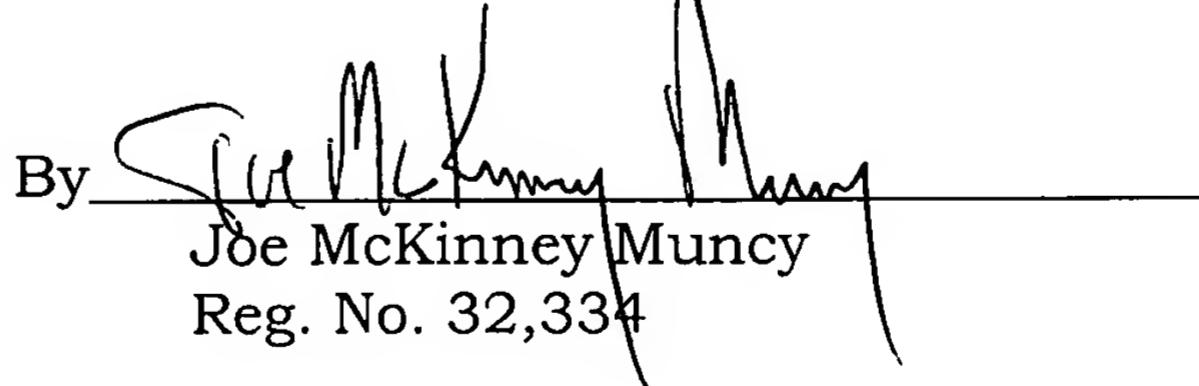
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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